

REMARKS/ARGUMENTS

The Official Action mailed January 19, 2006 has been carefully considered. Reconsideration and allowance of the subject application, as amended, are respectfully requested. The claims have been amended to overcome the Examiner's formal objections thereto, and to further define the invention over the art. No new matter has been added to the subject application as a result of the changed made thereto.

The Examiner's objection to the drawings, as noted as paragraph 1, page 2 of the Official Action, is not entirely understood. The Examiner appears to raise the issue that the "digital signal" is not shown in the drawings. However, as the Examiner can appreciate, the concept of a digital signal or an analog signal is well within the purview to one of ordinary skill in the art, and thus is it respectfully submitted that no amendments to the drawings are believed necessary. Indeed, as the Examiner is well aware, it is not necessary to describe in the specification or depict in a drawing that which is old. However, to be fully compliant with the Examiner's objection to the drawings, Applicants have amended the claims to remove reference to digital and analog signals. However, these amendments are being made to facilitate allowance of this case, and are not to be interpreted as any admission on behalf of the Applicants that the concept of digital signals are not adequately disclosed in the instant specification. Accordingly, no further discussion of the Examiner's objection to the drawings is believed necessary.

Turning to the rejections on the art, claims 1-6, 9-11 and 13-16 stand rejected under 35 USC § 103 as being unpatentable over Balogh (U.S. Patent No. 5,894,212). Applicants respectfully submit this rejection is in error.

The Examiner points to Balogh as disclosing, in Figure 1, "a wake up circuit 10 comprising circuit 32 adapted to receive a first signal representative of a charging current level [see column 3, line 10] provided to a battery via a path and a second signal representative of a predetermined wake up current level [see column 4, line 61] and to provide a comparison output signal in response to said first and second signal [see column 7, lines 103]; and an output decision circuit 32 adapted to receive at least said comparison output signal and a selector signal from a selector circuit 34, said output decision circuit providing one of said comparison output signal and said selector signal to

a switch 36 to control a state of said switch, said switch coupled to said path [see column 4, lines 46-50].” (page 3, Official Action).

The Examiner continues by stating that “Balogh discloses the claimed invention except for making the comparison circuit and the output decision circuit separate: it would have been obvious to one of ordinary skill in the art at the time the invention was made to make separable the comparison circuit and the output decision circuit in order to minimize an error due to a malfunctioning element, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art.” (page 3, Official Action). However, and as will be set forth in more detail below, Applicant does not hang patentability for this case on the fact that the comparison circuit and the output circuit are separate components, but rather, the fact that Balogh does not teach or suggest all of the claim limitations.

In pertinent part, Balogh discloses a processor 32 that “responds to voltages from cells in a battery by detecting any of the voltages being less than or equal to a predetermined threshold voltage. The processor samples cell voltages as a fast sampling rate and compares the sample voltages to a predetermined threshold value. The processor further identifies any cell having an associated voltage that is less than or equal to the predetermined threshold voltage.” (Balogh, abstract)

Further, Balogh describes a wake up circuit 40 that “responds to a current load from the battery by activating the processor.” The wake up circuit 40 “controls the switching of switch 36 between conductive (closed) and nonconductive (open) states.” (Balogh, page 4, lines 46-48). Importantly, it appears that the wakeup circuit 40 disclosed by Balogh operates to activate parts of the broader system 10 in response to discharge current levels from the battery 14. In pertinent part, nowhere does Balogh disclose or suggest the wake up circuit or the processor as being capable of controlling the conduction state of the switch to control the charging current level provided to the battery. In other words, it is Applicants’ understanding of Balogh that this reference discloses methodology to detect a discharge current of the battery.

In contrast to Balogh, Applicants’ invention of independent claim 1 requires “an output decision circuit configured to receive at least said comparison output signal and a selector signal from a selector circuit, said output decision circuit is configured to provide

one of said comparison output signal and said selector signal to a switch to control the charging current level provided to said battery by controlling the state of said switch, coupled to said path.” Applicants’ invention of independent claim 9 provides similar limitations. Applicants’ invention of independent claim 13 provides “providing a second signal to said switch, said switch responsive to said second signal to enter a full conduction state when said second signal is in a first state said full conduction state providing a second charging current level to said battery.”

Claims 2-8, 10-12 and 15 each depend from Applicants’ invention of independent claims 1, 9 or 13, as the case may be, and thus, must be read as incorporating the limitations of the independent claim. 35 USC § 112, 4th paragraph.

Accordingly, the invention of independent claims 1 and 9 require an output decision circuit that controls a switch to control a charging current level provided to the battery based on, for example, signals provided by the comparison circuit. Similarly, Applicants’ invention of independent claim 13 requires that the switch, responsive to the first signal, enters an intermediate conduction state to provide a charging current level to the battery representative of a predetermined wake up current level.

In short, these features are nowhere disclosed or suggested in Balogh, and thus, Balogh could not render obvious Applicants’ claims. Accordingly, it is respectfully submitted that claims 1-6, 9-11 and 13-16 as being unpatentable over Balogh is in error, and should be withdrawn.

Claims 8 and 12 stand rejected under 35 USC § 112 as being unpatentable over Balogh, as described above, in view of Brainard (U.S. Patent No. 5,371,456). Applicants respectfully submit that this rejection is also in error.

Claim 8 depends from Applicants’ invention of independent claim 1, discussed above in detail. Claim 12 depends from Applicants’ invention of independent claim 9, also discussed above in detail. It is not seen how Brainard supplied the missing teachings to Balogh to achieve or render obvious Applicants’ invention of independent claims 1 or 9. Suffice to note that nowhere does Brainard disclose or suggest an output decision circuit that controls the conduction state of a switch to control the charging current level provided to the battery based on, for example, one or more signals received from a comparison circuit. Accordingly, it is respectfully submitted that the Examiner’s

rejection of claims 8 and 12 under 35 USC § 103 as being unpatentable over Balogh in view of Brainard is in error, and should be withdrawn.

Claims 17-20 stand rejected under 35 USC § 103 as being unpatentable over Van Phuoc et al. (U.S. Patent No. 5,633,573). Applicants respectfully submit this rejection is also in error.

Van Phuoc discloses a battery pack and a method of operating a battery system. The battery pack includes a rechargeable battery and a processor for monitoring the battery during charging and discharging. The processor receives data values representing the battery voltage, temperature and current, and the processor performs a series of calculations using those data values. The processor has normal, standby and sleep modes. In the normal mode, the processor performs a series of calculations at first regular cycles, and in the standby mode, the processor performs a series of calculations at second regular cycles, which are longer than the first regular cycles. Preferably, the processor enters the standby mode when the battery current falls below a predetermined current level and the processor enters the sleep mode when the battery voltage falls below a first predetermined voltage level. Also, the processor exits the sleep mode when the battery voltage rises above a second predetermined voltage level higher than the first predetermined voltage level.” (Van Phuoc, abstract). Similar to the Examiner’s reliance on the Balogh reference, it appears that the Examiner is arguing that the patentability of Applicants’ invention of independent claim 17 stands or falls on the notion that the comparison circuit and the output decision circuit are separate elements (see, for example, the Official Action, page 4, cipher 5). However, as discussed above with respect to Applicants’ invention of independent claims 1, 9 and 13, the Examiner’s assertion that patentability lies by virtue of separate elements is misplaced.

Importantly, the wake-up circuit 80 provided by Van Phuoc appears to be a voltage level detector that activates parts of the broader system in response to a detected voltage. This is similar to Balogh, described above. In contrast, claim 17 requires, inter alia, “a wake up circuit comprising a comparison circuit and an output decision circuit, said comparison circuit is configured to receive a first signal representative of a charging current level provided to said battery via said second path and a second signal representative of a predetermined wake up current level of said battery and to provide a

comparison output signal in response to said first and second signal, said output decision circuit is configured to receive at least said comparison output signal and a selector signal from a selector circuit, said output decision circuit providing one of said comparison output signal and said selector signal to said second switch to control the charging current level provided to said battery by controlling the state of said second switch.” Simply put, nowhere does Van Phuoc disclose or suggest these limitations and accordingly, Van Phuoc could not achieve the advantages provided by the wake up and comparison circuits required by claim 17. It is further noted that claims 18-20 each depend directly or indirectly from Applicants’ invention of independent claim 17, and thus, must be read as incorporating the limitations of claims 17 as well as their own patentable limitations. 35 USC § 112, 4th paragraph.

Accordingly, it is respectfully submitted that the Examiner’s rejection of claims 17-20 under 35 USC § 103 as being unpatentable over Van Phuoc et al. is in error, and should be withdrawn.

The Examiner’s indication of the allowable subject matter of claim 7 is noted, with thanks. However, in view of the foregoing amendments and remarks, it is respectfully submitted that all currently pending claims are in condition for allowance. Accordingly, having dealt with all the objections raised by the Examiner, it is respectfully submitted that the present application, as amended, is in condition for allowance. Thus, early allowance is earnestly solicited.

If the Examiner desires personal contact for further disposition of this case, the Examiner is invited to call the undersigned Attorney at 603.668.6560.

In the event there are any fees due, please charge them to our Deposit Account No. 50-2121.

Respectfully submitted,

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